VERMONT
DEPARTMENT OF HEALTH

Colorectal Cancer in Vermont

Vermont Cancer Registry   **March 2013**

Vermont Facts

- ❖ **Incidence:** Colorectal cancer is the third most common cancer diagnosed among men and women. Each year approximately 149 colorectal cancer cases are diagnosed among men and 162 cases among women.

- ❖ **Mortality:** Colorectal cancer is the third leading cause of cancer death among men and women. Each year approximately 56 men and 59 women die from colorectal cancer.

- ❖ **Trends:** Incidence and mortality rates for colorectal cancer have declined during 2000-2009.

- ❖ **Vermont vs. U.S.:** The colorectal cancer incidence rate among Vermont males is lower than the U.S, but colorectcal mortality is not different. The colorectal incidence and mortality rates among Vermont women are not different from the U.S.

- ❖ **Age:** As with most cancers, the risk for developing colorectal cancer increases with age. Colorectal cancer is most often diagnosed among men and women over age 50.

- ❖ **Stage:** In Vermont, 47 percent of invasive colorectal cancers are diagnosed at the localized stage (the cancer is limited to the organ of origin), 31 percent are diagnosed at the regional stage, and 18 percent are diagnosed at the distant stage (the cancer has extended beyond the local organ or has metastasized).

- ❖ **Screening:** According to the 2010 BRFSS, 71 percent of men and women age 50-75 have been screened for colorectal cancer. Vermont has a higher percentage of men and women meeting screening guidelines compared to the U.S. (63 percent).

Background

Any disease in which abnormal cells develop, divide, grow, and have the potential to spread throughout the body can be called cancer. If the spread of these cancer cells is not controlled, death may result. Cancer cells from a malignant tumor can invade nearby tissues either by direct growth into adjacent tissue or by migration through the bloodstream and lymphatic system to other parts of the body. This process is called metastasis. Cancer that started as colorectal cancer and spread to the liver or bone is still colorectal cancer.

In 2007, cancer overtook heart disease as the leading cause of death in Vermont, with approximately 1,200 Vermonters dying from cancer each year. In contrast to the dramatic declines in the death rates for heart disease and stroke, the cancer death rate has risen steadily over the past few decades as a result of the aging population and the continued rise in death rates from lung cancer. Roughly one out of every two men and one out of every three women will develop cancer in their lifetime.

Colorectal Cancer

Located within the digestive system, the colon and rectum make up the large bowel, or large intestine. The colon refers to the upper five or six feet of the large intestine, and the rectum refers to the last five or six inches. Because of similarities between cancer of the colon and rectum, cancers in either of these sites are often grouped as colorectal cancer. Roughly one out of every 19 men and one out of every 20 women will develop colorectal cancer in their lifetime.

Incidence and Mortality

Defined as the number of *new* cases occurring in a population during a defined time interval, incidence rates are a useful measure of the risk of disease.

Table 1. The most commonly diagnosed cancers in males and females – Vermont, average number of cases per year, 2005-2009.

Male Cancer Site	Cases (per year)	Percent (per year)	Female Cancer Site	Cases (per year)	Percent (per year)
Prostate	519	29%	Breast	500	29%
Lung	262	14%	Lung	254	15%
Colon and Rectum	**149**	**8%**	**Colon and Rectum**	**162**	**9%**
Bladder	136	8%	Uterus	126	7%
Melanoma	114	6%	Melanoma	95	5%
All Sites	1,818	100%	All Sites	1,753	100%

New cases per year exclude basal cell and squamous cell skin cancers and in situ carcinomas except urinary bladder.

❖ An average of 1,818 cancers in males and 1,753 cancers in females are diagnosed each year in Vermont. Of those, an average of 149 men and 162 women are diagnosed with colorectal cancer each year.

❖ Colon cancer is the third most common cancer diagnosed among males and females and accounts for roughly eight percent of all cancers diagnosed among Vermont men and nine percent diagnosed among Vermont women.

The mortality rate is a measure of the number of deaths in a population during a specific period of time.

Table 2. The most common cancer deaths in males and females – Vermont, average number of deaths per year, 2005-2009.

Male Cancer Site	Deaths (per year)	Percent (per year)	Female Cancer Site	Deaths (per year)	Percent (per year)
Lung	192	30%	Lung	176	29%
Prostate	59	9%	Breast	82	13%
Colon and Rectum	**56**	**9%**	**Colon and Rectum**	**59**	**10%**
Pancreas	41	6%	Pancreas	39	6%
Bladder	32	5%	Ovary	27	4%
All Sites	641	100%	All Sites	613	100%

❖ An average of 641 males and 613 females die each year from cancer in Vermont. Of those, an average of 56 men and 59 women die from colorectal cancer.

❖ Colorectal cancer is the third leading cause of cancer death for males and females in Vermont and accounts for roughly nine percent of all cancer deaths among Vermont men and ten percent of deaths among Vermont women.
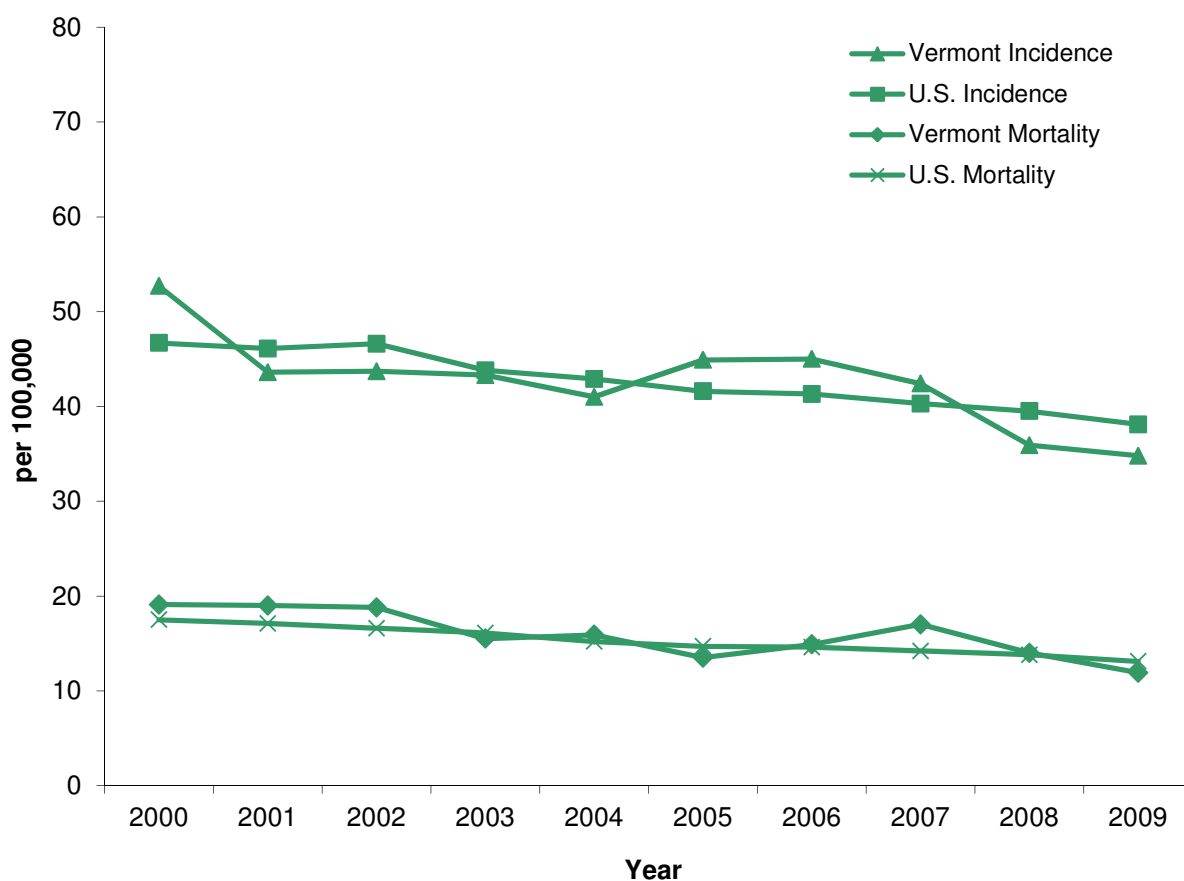
Trends

Figure 1. Incidence and mortality rates of male colorectal cancer – Vermont and United States, 2000-2009.
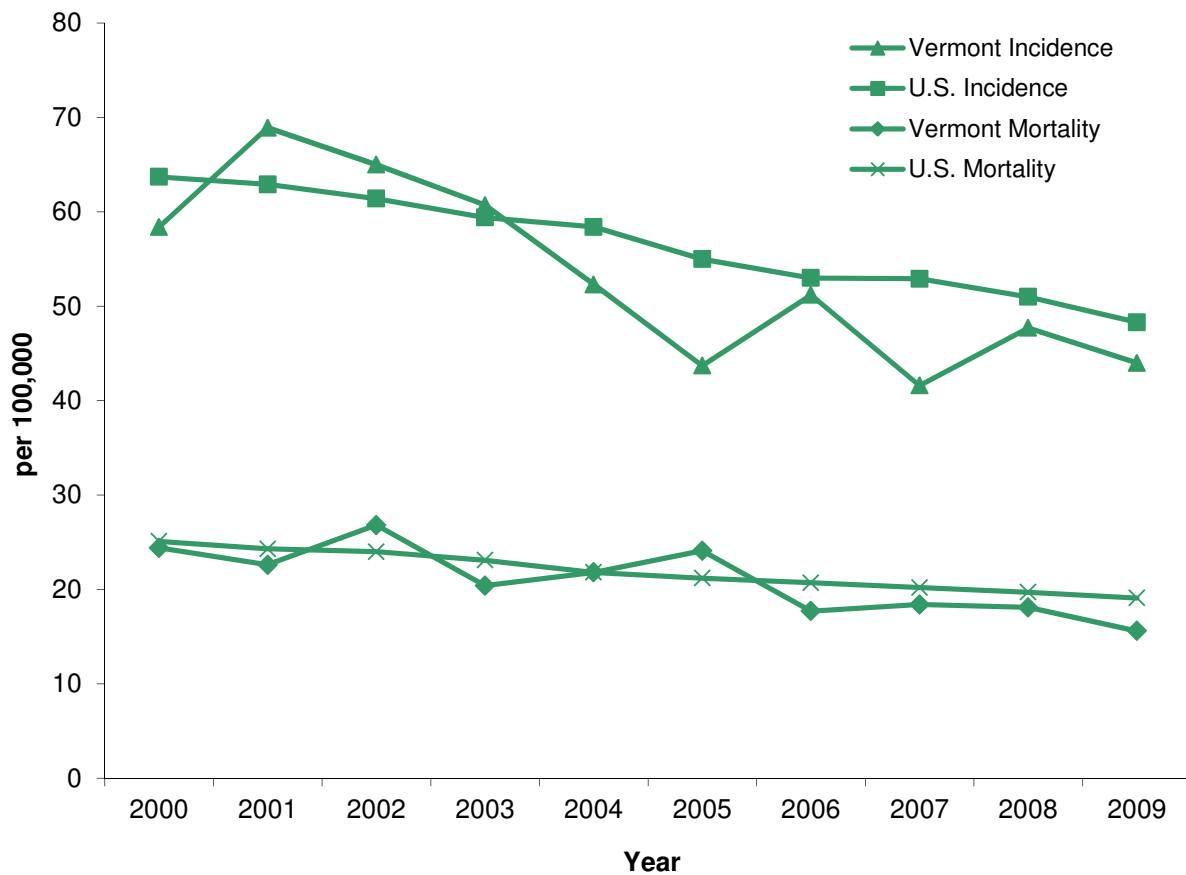
- ❖ From 2000 to 2009, the declines in the incidence and mortality of male colorectal cancer were statistically significant for Vermont and the U.S.

Figure 2. Incidence and mortality rates of female colorectal cancer – Vermont and United States, 2000-2009.

- ❖ From 2000 to 2009, the declines in the incidence and mortality of female colorectal cancer were statistically significant for Vermont and the U.S.

U.S. Comparisons

	Incidence	Mortality
Vermont Males	45.6	18.6
U.S. Males	51.9	20.2
Vermont Females	40.5	14.2
U.S. Females	40.1	14.1

❖ The colorectal cancer incidence rate among Vermont males is lower than the U.S., but the male mortality rate is not different from the U.S.

❖ The colorectal cancer incidence and mortality rates among Vermont females are not different from the U.S.

Age

The incidence of many cancers increases with age. While younger adults can develop colon cancer, about 90 percent of colon cancers are diagnosed in men and women age 50 and older.

Figure 3. Incidence rates of male colorectal cancer, by age – Vermont and United States, 2005-2009.
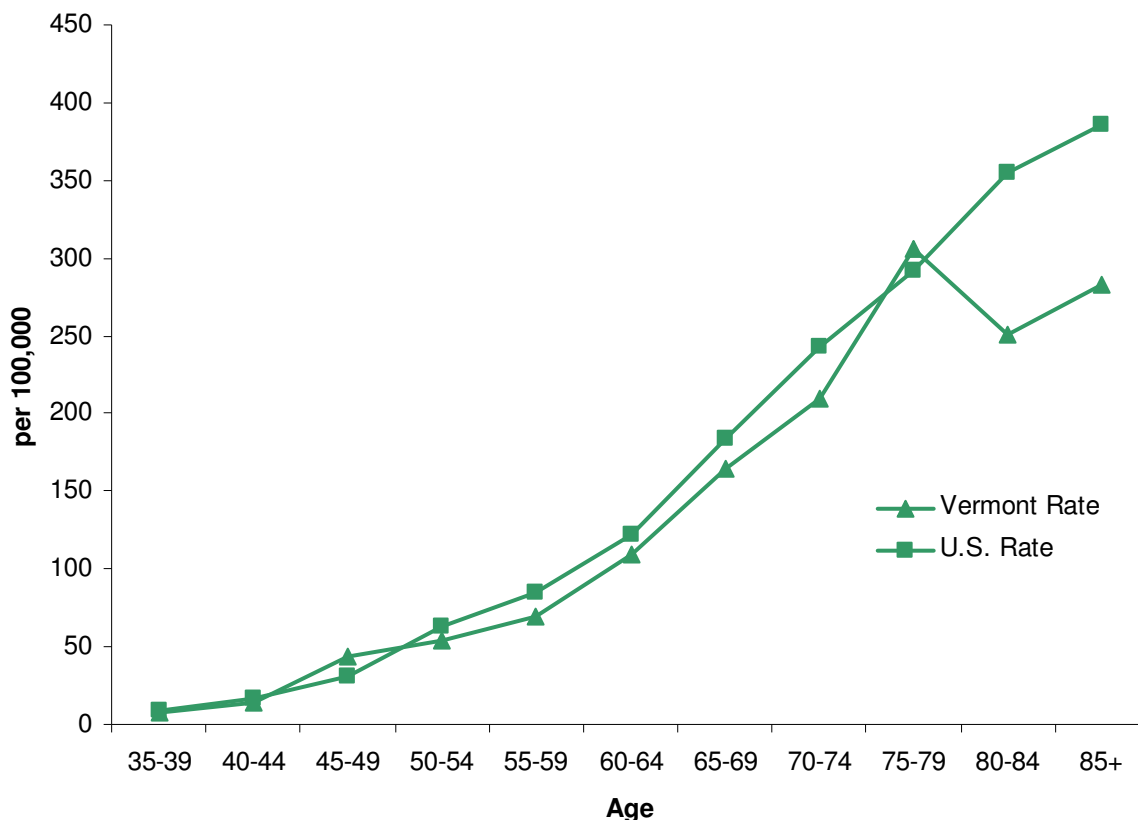
Age Group	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Vermont Rate	8.1	14.1	43.2	54.2	69.4	109.2	164.9	209.7	306.6	250.8	282.4
U.S. Rate	8.9	16.4	31.3	63.0	84.9	122.4	183.6	243.3	292.2	354.5	385.4

❖ Vermont males age 75-79 have the highest age-specific incidence of colorectal cancer, at a rate of 306.6 per 100,000.

❖ Between 2005 and 2009 Vermont males age 80 and older had a lower rate of colorectal cancer compared to the U.S.

**Figure 4. Incidence rates of female colorectal cancer, by age – Vermont and United States, 2005-2009.**
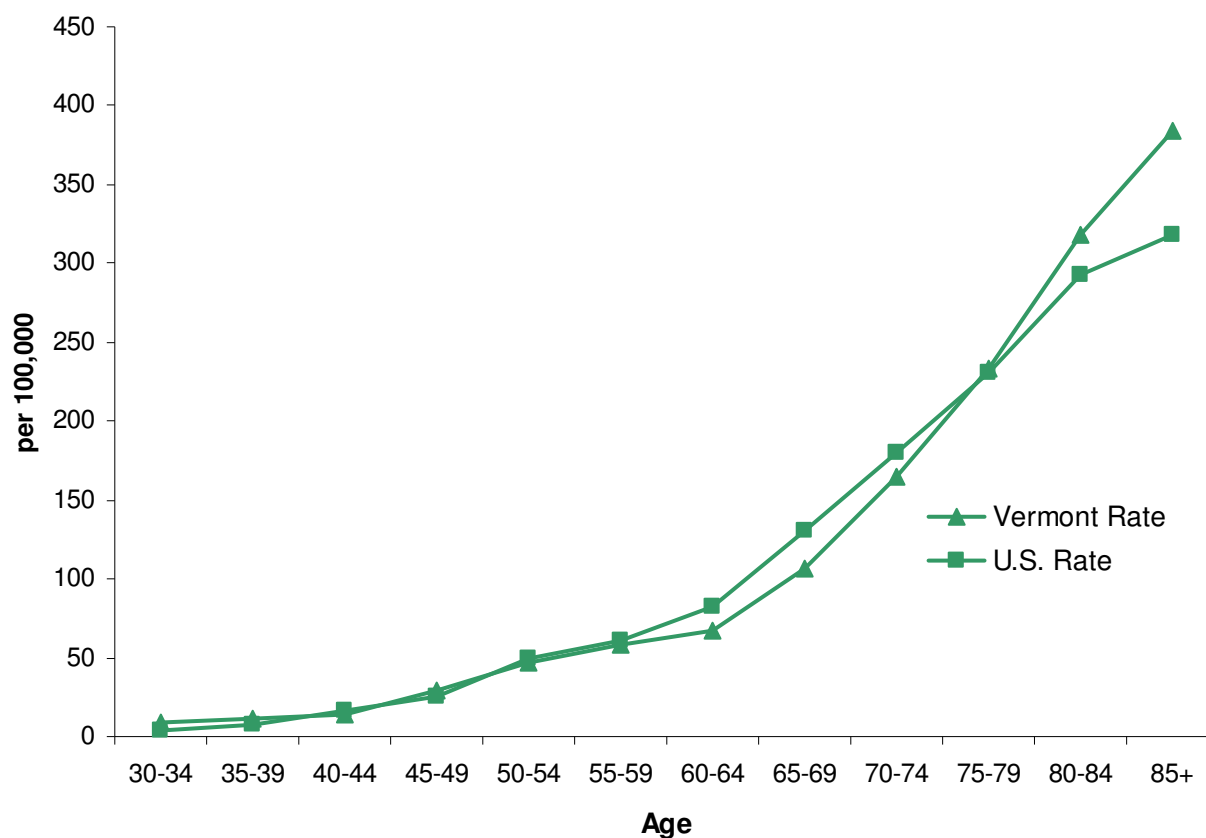
Age Group	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Vermont Rate	9.1	11.9	13.6	28.7	46.8	58.0	67.7	106.0	165.3	233.2	318.6	383.9
U.S. Rate	4.3	7.9	16.1	25.4	49.0	60.8	81.9	130.3	179.7	230.8	292.8	318.7

❖ Vermont women age 85 and older have the highest age-specific incidence of colorectal cancer, at a rate of 383.9 per 100,000.

❖ Between 2005 and 2009 there were no differences in age-specific incidence rates of colorectal cancer between Vermont and U.S. females.

Stage at Diagnosis

Stage describes the extent to which the cancerous cells have spread from the original site to another part of the body; it helps determine prognosis and treatment options. Invasive colorectal cancer can be grouped into the following stage categories: localized, regional, distant, and unstaged. The earlier a cancer is diagnosed, the better a person's prognosis is likely to be. Cancers occurring in parts of the body that can be easily seen or felt (e.g. skin or breast) are easier to detect at a localized stage compared to cancers of internal organs, which require imaging procedures and/or laboratory tests to detect.

Figure 5. Invasive colorectal cancer by stage at diagnosis – male and female, Vermont and the United States, 2005-2009.
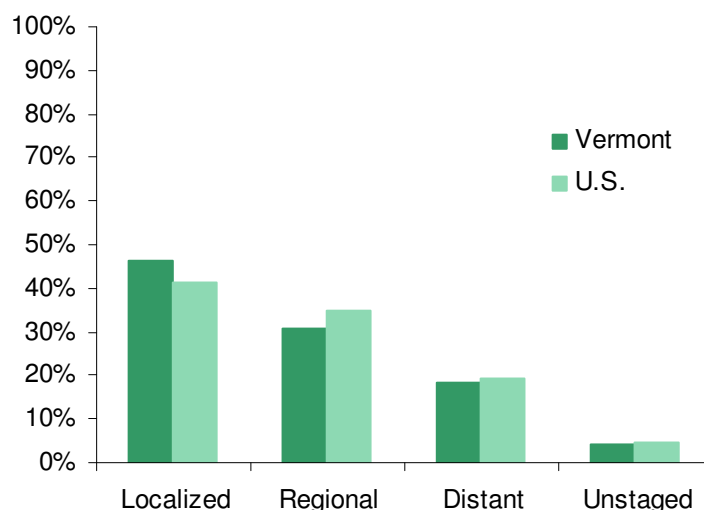

- ❖ Among Vermonters , approximately 47 percent of invasive colorectal cancers are diagnosed at the localized stage, 31 percent are diagnosed at a regional stage, and 18 percent are diagnosed at a distant stage. In the U.S., 41 percent of colorectal cancers are diagnosed at the early stage, 35 percent are diagnosed at a regional stage, and 19 percent are diagnosed at a distant stage.

- ❖ Fewer Vermonters are diagnosed at a regional stage and more are diagnosed at a localized stage compared to the U.S.

Advanced Stage at Diagnosis

The rate of cases of cancer that are diagnosed at an advanced stage (regional or distant) is a measure of the effectiveness of cancer screening efforts.

Figure 6. Incidence rates of advanced stage colon cancer, men and women age 50 and older - Vermont and the United States, 2000-2009.
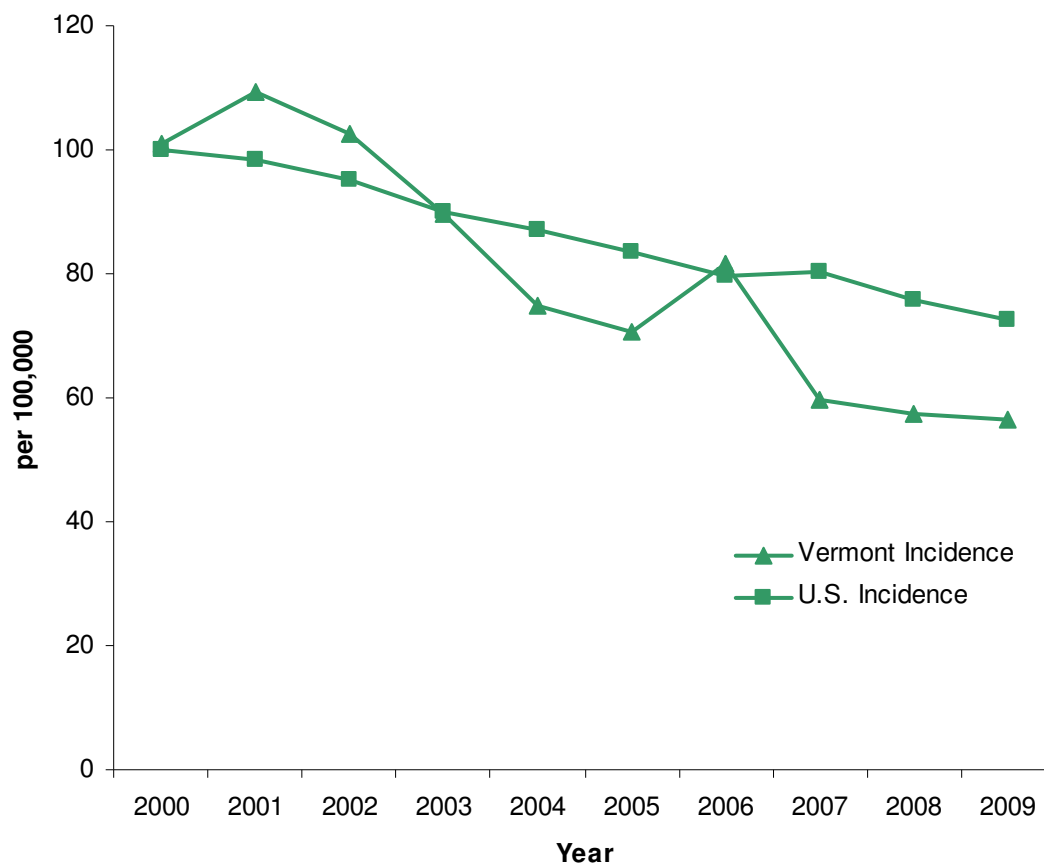
- ❖ Between 2000 and 2009 the Vermont rate of advanced stage colorectal cancer among men and women age 50 and older (79.3 per 100,000) is lower than the U.S. rate (85.7 per 100,000).

- ❖ The declines in advanced stage colorectal cancer trends were statistically significant for Vermont and the U.S.

Risk Factors

A risk factor is a condition, an activity, or an exposure that increases a person's chance of developing cancer. Cancer develops gradually as a result of a complex mix of factors related to lifestyle choices, environment, and genetics. Each type of cancer is caused by a different set of factors, some well established, some uncertain, and some unknown. Some factors, like a person's age or race, can't be changed. Others can be linked to cancer-causing factors in the environment. Still others are related to personal behaviors, such as smoking, drinking, and diet. Many individuals with known risk factors never develop colorectal cancer, and many who do develop cancer have none of the known risk factors. Some factors influence risk more than others, and a person's risk for colorectal cancer can change over time, due to factors such as aging or lifestyle. The exact causes of colorectal cancer are unknown, but some of the factors associated with an increased risk of developing colorectal cancer are:

❖ **Age:** The incidence of colon cancer, as with many cancers, increases with age. Ninety percent of people with this disease are diagnosed after age 50 in the U.S.

❖ **Family History:** Having one or more first-degree relatives (parents, siblings, or children) with a history of polyps or colorectal cancer increases risk. If more than one family member has colorectal cancer, the risk is even greater.

❖ **Polyps:** Polyps are growths on the inner wall of the colon or rectum. Most polyps are benign (non-cancerous) growths, but some types of polyps increase the risk of colon cancer, especially if they are large or if there are many of them. Removing colon polyps at the time of colonoscopy reduces the resulting risk of colon cancer.

❖ **Previous Cancer:** Having had a previous diagnosis of colorectal cancer or adenomatous polyps, even if the cancer has been completely removed increases the risk that new cancers may start in other areas of the colon or rectum.

❖ **Inherited Syndromes:** Changes in certain genes increase the risk of colon cancer. A small percentage of colon cancers are associated with an inherited colon cancer syndrome, called hereditary non-polyposis colon cancer (HNPCC), or Lynch syndrome. Another small percentage of colon cancer cases are associated with an inherited syndrome, called familial adenomatous polyposis (FAP), which involves having hundreds of polyps in the colon or rectum. Cancer can develop in one or more of these polyps.

❖ **Inflammatory Bowel Disease:** Chronic inflammatory bowel disease (IBD), including ulcerative colitis and Crohn's disease, is a condition in which the colon is inflamed over a long period of time. A personal history of IBD increases the risk of developing colorectal cancer.

❖ **Diabetes:** Individuals with type-2 diabetes have an increased risk of developing colon cancer. Both colorectal cancer and type-2 diabetes share some risk factors (e.g. obesity and physical inactivity), but even with these risk factors taken into account, individuals with type-2 diabetes still have an increased risk for colorectal cancer.

❖ **Race and Ethnic Background:** African-Americans have a greater risk of colorectal cancer than do individuals of other races. Jews of Eastern European descent (Ashkenazi Jews) have an increased risk for developing colorectal cancer that has been linked to several gene mutations.

❖ **Diet:** Diets that are high in red meats and processed meats may increase risk. Risk has also been associated with a diet low in fiber and high in fat and calories. Diets that are high in vegetables, fruits, and whole grains have been linked to decreased risk.

❖ **Physical Inactivity and Obesity:** Individuals who are not physically active have a greater chance of developing colon cancer. The risk of developing and dying from colon cancer is increased for very overweight individuals.

❖ **Tobacco:** Smokers are more likely than non-smokers to develop and die from colorectal cancer.

❖ **Alcohol:** Increased colorectal cancer risk has been associated with the heavy use of alcohol.

❖ **Radiation Therapy for Cancer:** Radiation therapy directed at the abdomen to treat previous cancers may increase the risk of colorectal cancer.

Prevention and Screening

There are some risk factors for colorectal cancer that an individual can control, such as diet and physical activity. Being overweight or obese can increase the risk for colorectal cancer. Diets that are high in vegetables, fruits, and whole grains, while low in red and processed meat, can reduce colorectal cancer risk. Additionally, studies have identified lower risk of colorectal cancer and polyps with increasing levels of physical activity. Moderate activity on a regular basis lowers the risk, and vigorous activity may have greater benefits.

Regular colorectal cancer screening is the most effective way to prevent colorectal cancer. Screening is the process of looking for cancer in people who have no symptoms of the disease.

From the time the first abnormal cells start to grow into polyps, it typically takes about 10 to 15 years for them to develop into colorectal cancer. Regular screening can, in many cases, prevent colorectal cancer altogether. With screening, polyps can be found and removed before they can develop into cancer. Screening can also find colorectal cancer early. The three primary screening tests are the **fecal occult blood test (FOBT)**, flexible **sigmoidoscopy**, and **colonoscopy**.

The **fecal occult blood test (FOBT)** is used to find occult (hidden) blood in feces. Blood vessels at the surface of colon polyps or adenomas (cancers) are often fragile and easily damaged by the passage of feces. The damaged vessels usually release a small amount of blood into the feces. If this test is positive, a colonoscopy is needed to see if there is a cancer, polyp, or other cause of bleeding.

A sigmoidoscope (**sigmoidoscopy**) is a slender, flexible, hollow, lighted tube. When inserted through the rectum, it enables the physician to view the inside of the large intestine, from the rectum through the last part of the colon, called the sigmoid or descending colon. Polyps that are visualized during the procedure can be removed; however, flexible sigmoidoscopy is not sufficient to detect polyps or cancer in the ascending or transverse colon (two-thirds of the colon). If an adenomatous polyp or colon cancer is found during the procedure, a colonoscopy is needed to look for polyps or cancer in the rest of the colon.

A colonoscope (**colonoscopy**) is a longer version of a sigmoidoscope. When inserted through the rectum it allows the doctor to see the lining of the entire colon. If a small polyp is found, it may be removed by the physician during the procedure. The colonoscopy enables viewing of the entire colon and can be used as both a screening and preventive tool.

Individuals who have no identified risk factors (other than age) should begin regular screening at age 50. Those who have a family history or other risk factors for colorectal polyps or cancer, such as inflammatory bowel disease, should talk with their doctor about starting screening at a younger age or get screened more frequently.

Screening guidelines issued by the U.S. Preventive Services Task Force (USPTF) recommend screening for colorectal cancer using an annual fecal occult blood test (FOBT), **or** a sigmoidoscopy every five years <u>and</u> a FOBT every three years, **or** colonoscopy every ten years, beginning at age 50 and continuing until age 75.

As part of the Vermont State Cancer Plan 2015 and Healthy Vermonters 2020 (HV2020), the colorectal cancer screening objective is to increase the percentage of men and women (age 50-75) who receive the recommended colorectal cancer screening tests.

State Cancer Plan 2015 Goal: 75 percent
HV2020 Goal: 80 percent
VT Status 2010:   71 percent (BRFSS, 2010)

Colorectal Cancer Screening Disparities

In Vermont, colorectal cancer screening rates have increased from 68 percent in 2008 to 71 percent in 2010. Vermont has a higher percentage of men and women meeting the colorectal cancer screening guidelines compared to the U.S. (63 percent). However, certain populations report lower rates of colorectal cancer screening. The following characteristics are significant predictors of colorectal cancer screening among men and women age 50 to 75:

- **Having a personal doctor:** 73 percent of Vermonters with a personal doctor were screened for colorectal cancer, compared to 35 percent of those without a personal doctor.
- **Health insurance:** 73 percent of men and women with health insurance get screened for colorectal cancer, compared to 40 percent of those without insurance.
- **Income at or below 125 percent of the Federal Poverty Level:** 78 percent of Vermonters with an income at or above 350 percent of the Federal Poverty Level (FPL) report screening for colorectal cancer, compared to 59 percent below 125 percent of the FPL.
- **Education:** 75 percent of Vermonters with a college degree or greater were screened for colorectal cancer, compared to 64 percent of those with a high school education or less.
- **Gender:** There are no differences in overall rates of screening compliance by gender.

Using BRFSS data, we can also look at whether Vermonters with known risk factors for colon cancer are getting screened:

- **Age:** 62 percent of Vermonters age 50 to 59 were screened for colon cancer compared to 79 percent of those age 60 to 69 and 77 percent of those aged 70 to 75.
- **Obesity:** There were no differences in overall rates of screening compliance between Vermonters who are considered to be obese, overweight, or of healthy weight (neither overweight or obese).
- **Diabetes:** There are no differences in overall rates of screening compliance between Vermonters who have diabetes, compared to those who do not.
- **Smoking Status:** 72 percent of non-smokers were screened for colorectal cancer, compared to 59 percent of current smokers.

Survival and Treatment

Survival rate refers to the percentage of people who are alive for a given period of time after diagnosis and is an indication of disease prognosis. The prognosis and treatment of colorectal cancer is largely determined by stage of the disease, which considers the size of the tumor, involvement of nearby organs, lymph node status, and whether metastatic disease is present. The five-year survival rate refers to the percentage of individuals who live at least five years after being diagnosed; many live much longer than five years. Nationally, 90 percent of men and women whose colorectal cancer is diagnosed at a localized stage survive their cancer for at least five years, compared to 12 percent of those diagnosed with distant stage colorectal cancer.

Treatment and prognosis depend upon the histological type of cancer, the stage, and one's overall health. Possible treatments or combinations of treatments include **surgery**, **radiation** therapy (ionizing radiation to kill cancer cells), **chemotherapy** (a method that uses drugs to destroy cancer cells), and **palliative care**.

Chemotherapy may be administered before surgery (neoadjuvant therapy) to shrink the tumor and reduce the amount of tissue that needs to be removed during surgery. Following surgery, some patients may receive radiation therapy, along with chemotherapy, to kill any remaining cancer (adjuvant therapy). Chemotherapy may also be used to shrink tumors and relieve symptoms of cancers that have spread to other organs (palliative care).

Surgery is often the treatment for localized (early stage) colorectal cancers. A **colectomy** removes part of the **colon**, as well as nearby lymph nodes. The surgery is referred to as an **open colectomy** if it is done through a single incision in the abdomen and as a **laparoscopic-assisted colectomy** if the surgery is completed using a laparoscope and several smaller incisions. Surgery is also the main treatment for **rectal** cancer, however, radiation and chemotherapy may be given before or after surgery. There are several surgical methods used for removing rectal cancers.

Radiation therapy uses ionizing radiation to kill cancer cells. Normal cells are able to repair radiation damage, while cancer cells are not. A combination of radiation and chemotherapy may be useful for rectal cancer, however, it is used less as a treatment for colon cancer because of the sensitivity of the bowels to radiation. Radiation may be used for colon cancer that has spread.

Clinical trials are generally designed to compare potentially better therapy with therapy that is currently accepted as standard and can be an important option for many individuals when considering treatment of this disease. Most of the progress made in identifying curative therapies for cancers has been achieved through clinical trials.

Information about ongoing clinical trials is available from the National Cancer Institute at: http://www.cancer.gov/clinicaltrials/search.

Palliative care may be offered when treatments no longer offer a cure and a decision is made to choose supportive care instead. Palliative care is any form of medical care or treatment that concentrates on reducing the severity of disease symptoms, rather than halting or delaying progression of the disease itself or providing a cure. The goal is to prevent and relieve suffering and to improve quality of life for people facing serious, complex illness.

Intervention, Policy, and Recommendations

The Vermont State Cancer Plan[1], published by the Vermont Department of Health and **Vermonters Taking Action Against Cancer (VTAAC)**, provides a strategic roadmap for reducing the burden of cancer in Vermont by 2015. The plan identifies state-wide priorities in the following areas: prevention, early detection, treatment access and quality, quality of life, and end-of-life care.

The burden of cancer for all Vermonters can be reduced, and the 2015 Vermont State Cancer Plan provides specific goals to move our state forward. Goals related to colorectal cancer are:

Prevent future cancers by reducing exposure to known risk factors:
• Decrease the prevalence of obesity through good nutrition and increased physical activity. For more information about the Fit & Healthy Vermonters Plan visit: http://healthvermont.gov/fitandhealthy.aspx.

Detect new cancers as early as possible through appropriate screening:
• Increase early detection of colorectal cancer among Vermonters.

Increase access to optimal cancer treatment and care:
• Increase informed decision making for Vermont cancer patients and oncologists.
• Increase adherence to NCCN treatment standards for colorectal cancers at Vermont ACoS cancer centers.
• Reduce pain, discomfort, and distress among Vermont cancer patients and survivors.
• Increase integration of complementary and alternative medicine (CAM) and oncology.
• Reduce financial and practical barriers to optimal cancer care among Vermonters.

Improve the quality of life for people living with, through and beyond cancer, as well as **improve end-of-life** care for cancer patients:
• Promote optimal health among cancer survivors in Vermont.
• Increase the use of hospice care for Vermont cancer survivors.
• Improve planning for end of life care for cancer survivors and other Vermonters.

Vermonters Taking Action Against Cancer (VTAAC) is a statewide coalition of more than 240 people – cancer survivors, advocates, public health and health care professionals, and others – all dedicated to reducing the impact of cancer for all Vermonters. The Vermont Department of Health and VTAAC are working together to raise awareness, prevent cancer where possible, and improve the prospect of survival for those who are diagnosed with cancer.

For more information about VTAAC visit http://vtaac.org. For more information on the State Cancer Plan or current activities and progress, visit: http://healthvermont.gov/cancer.

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[1] Vermont State Cancer Plan, 2015: http://healthvermont.gov/prevent/cancer/documents/2015VermontStateCancerPlan-1-21-11.pdf.

Data Sources

Vermont Cancer Registry: The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed among Vermont residents as well as out of state residents who are diagnosed or treated in Vermont. The registry enables the state to collect information on new cases (incidence) of cancer since January 1, 1994. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Vermont Department of Health Cancer Registry, 2000-2009. The Vermont Cancer Registry can be contacted at 802-865-7749 (http://healthvermont.gov/research/cancer_registry/registry.aspx).

Vermont Vital Statistics: In Vermont, all deaths are registered using an Electronic Death Registration System which is maintained by the Vermont Department of Health (VDH), Vital Statistics. Death certificates are available from towns with appropriate jurisdiction or the VDH Vital Records Office. Vital Statistics Bulletins are posted at: http://healthvermont.gov/research/index.aspx#vital.

Behavioral Risk Factor Surveillance System: Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey. Suggested citation: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008 and 2010. http://healthvermont.gov/research/brfss/brfss.aspx

Surveillance, Epidemiology, and End Results: The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the U.S. population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries rates. Suggested Citation: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2009, National Cancer Institute. Bethesda, MD, 2011 (http://www.seer.cancer.gov/csr/1975_2009).

U.S. Vital Statistics: The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates represented in this report are for the U.S. population. Suggested Citation: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. (1969-2009), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2012. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Technical Notes and Definitions

Age Adjustment: All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

Incidence: Incidence refers to the number or rate of newly diagnosed cases of cancer. The incidence rate is calculated as the number of new cancer cases diagnosed in the state during one year divided by the number of residents in the state during the same year. The incidence data presented in this report were coded using the International Classification of Disease for Oncology (ICD-O) coding system. Colorectal cancer cases were defined as invasive neoplasms with ICD-O-3 site code C18.0-C18.9, C19.9, C20.9, and C26.0, with the exception of histology 9590-9989 (or equivalent for older data).

Mortality: Mortality refers to the number or rate of deaths from cancer. The mortality data presented here were coded using the International Classification of Diseases Tenth Edition (ICD-10).

Race: U.S. incidence and mortality rates for all races are used for comparison. Racial minority groups were estimated to make up 4.7 percent of the total Vermont population, compared with the total U.S. non-white population of 28 percent in 2010. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents of other races may have very different risks of these cancers.

Federal Poverty Level (FPL): The set minimum amount of income that a family needs for food, clothing, transportation, shelter and other necessities. In the United States, this level is determined by the Department of Health and Human Services. FPL varies according to family size. The number is adjusted for inflation and reported annually in the form of poverty guidelines. Public assistance programs, such as Medicaid in the U.S., define eligibility income limits as some percentage of FPL.

Statistical Significance: A statistically significant difference indicates evidence of a State rate difference from the U.S. rate and indicates that the difference did not occur due to chance.

Small Numbers: Rates are not presented in this report if they are based on fewer than 6 cases.